As professor of physical geography in the University of Odessa, as organizer of a network of meteorological stations thruout southwestern Russia, and as director of the magnetic and meteorological observatory at Malyĭ-Fontàn, near Odessa, Dr. A. Klossovskiĭ has done valiant service in his chosen science. The present volume forms a worthy conclusion of his long-continued and efficient labors. In addition to a modest account by Professor Klossovskiĭ of the rise and progress of the institutions under his charge, it contains a large amount of valuable material for the meteorology of southwestern Russia and a number of special scientific papers by some of his assistants. Among these may be mentioned; Tochidlovskiĭ, On the formation of nuclei in fogs; Ignatiev, On the use of kites in meteorology; Obolenskiĭ, On the theory of the rainbow and of halos; and Aganin, A preliminary paper on gravity determinations at Odessa.

In view of the well known strong perturbation in the earth's magnetic field in the vicinity of Odessa it is of interest to know that careful gravity determinations are in progress.

It is certainly a matter of regret that the two journals created by Professor Klossovskiĭ will not be continued. And it would be still more to be lamented if Professor Klossovskiĭ can not find some means of continuing and completing his work on meteorology of which the first volume[2] (of 642 pp., with numerous illustrations and a map) appeared in 1907. It is to be hoped that now, in his retirement from active service, the author may find leisure to complete this great work which was planned to comprise three more volumes.

THE WEATHER OF THE MONTH.

By Mr. P. C. DAY, Acting Chief, Climatological Division.

PRESSURE AND WINDS.

The distribution of the mean atmospheric pressure for January, 1909, over the United States and Canada, is graphically shown on Chart VI, and the average values and departures from the normal are shown for each station in Tables I and III.

The mean atmospheric pressure for the month showed marked departures from normal conditions, the most important of which was an unusual depression over the central and northern portions of the Plateau and Pacific coast districts, where the average pressure ranged from .15 to .25 inch below the normal. It was also below the normal over practically all the remaining districts west of the Rocky Mountains, including the southern portions of British Columbia. East of the Rocky Mountains the average pressure for the month was above the normal in all districts of the United States and Canada, except over extreme southern Florida; the excess over the districts from the Lake region eastward ranging from .05 to .10 inch.

Many of the high pressure areas of the month appear to have had their origin in northern British Columbia west of the Main Divide instead of over the Great Plains to the east of the mountains, their usual point of origin. With pressure unusually low over the Plateau and Pacific coast districts, especially during the first half of the month, cold northerly winds from the high areas over northern British Columbia dominated the weather over the extreme northern portions of the United States from the Rocky Mountains to the Pacific.

Over the districts between the Rocky and Appalachian mountains the prevailing winds were mostly south, while along the Atlantic coast and over the east Gulf States they were generally from some northerly point. Much stormy weather, with cold, high northerly winds prevailed over the north Pacific and northern Plateau districts during the first half of the month.

TEMPERATURE.

January, 1909, was marked by unusual variations in temperature, decided excesses persisting in some localities and deficiencies of equal persistence occurring in others. During the first decade of the month remarkably cold weather prevailed over a restricted area from the Great Lakes westward to the Pacific, being most pronounced over the upper Missouri Valley and the northern portions of the Rocky Mountain, Plateau and Pacific coast districts, where the daily means ranged from 15° to 25° below the average. Minimum temperatures during portions of the above period were unusually low over the States from North Dakota to Washington, ranging from 20° to more than 50° below zero and exceeding in severity any previous record of cold weather for the same period at numerous points, especially in portions of eastern Washington and northern Oregon.

During this decade some unusually warm weather occurred over the districts from the Texas coast to the middle Plateau region and generally over the Southwest, where the mean temperature for the period ranged from 8° to 12° above the normal, and it was also above the normal over all eastern districts.

The second decade was marked by comparatively moderate temperatures over all districts, except over the States from Montana to Washington where extremely cold weather continued until about the 15th. The mean temperature was generally above the normal over the central and southern portions of the Rocky Mountain, Plateau, and Pacific coast districts, and also over most of the Atlantic and Gulf coast districts during the entire period.

During the third decade unusually warm weather was prevalent over all districts until about the 27th, when a severe storm developed over the Great Plains region and moved eastward during the last few days of the month, bringing the severest weather of the season to the districts from the lower Missouri Valley eastward over portions of the Lake region, Ohio Valley, and New England. Unusually warm weather prevailed from the 22d to the 25th over practically all districts from the middle and southern slope regions eastward to the Atlantic; the maximum temperatures during that period at numerous points equalled or exceeded any previous January record.

As a whole, the mean temperature for the month was above the normal over all districts, except a narrow strip along the northern border from central North Dakota westward to the Pacific. Over large portions of the Lake region, Ohio Valley, the Middle and South Atlantic, and Gulf States the average ranged from 5° to 7° above the normal, and over the region from the Texas coast northwestward to southern Idaho and eastern Oregon the average temperature ranged from 6° to 9° daily above the normal.

The remarkably restricted and persistent area of cold that prevailed over the northern portions of the States from North Dakota to Washington during the first half of the month carried the mean temperature for the section from 3° to 8° below the normal, despite the fact that the latter part of the month was unusually warm.

Maximum temperatures of 80°, or slightly higher, occurred from central Kansas southward over Texas, and in Georgia and Florida.

Minimum temperatures of 32° or lower extended to central Florida, central Arizona, and to nearly all districts in Cali-

[2] Klossovskiĭ, A[leksandr]. Meteorologïia. (Obshchiĭ kurs.) Chast I. Staticheskaia meteorologïia. [Meteorology. (General course.) Vol. I. Static meteorology.] Odessa. 1908. A long and appreciative review of this volume appears in Petermann's Mitteilungen, Jan., 1909, Literaturbericht' p. 17-19. If completed as planned, this will be the most extensive treatise on meteorology in any language.—*C. F. T.*

fornia, except the extreme southern part and along the immediate coast. Over the interior of New England they were from 10° to 20° below zero, and over the districts from the upper Lakes westward to central Washington they ranged from 10° to 40° below zero, and at exposed points in Montana they were more than 50° below zero.

PRECIPITATION.

The most marked feature of the distribution of precipitation during the month was the generally heavy amounts received over the Pacific coast States, especially in California, where it was probably one of the rainiests months experienced since the settlement of that State. The average for the entire State, about 16 inches, is more than 10 inches above the normal January fall. The total monthly amounts, including melted snow, at numerous stations in the State, exceeded 50 inches, several stations reported more than 60 inches, and one station reported a total of 71.54 inches, an amount which probably exceeds any monthly precipitation previously reported from any point in the United States.

The month was an unusually rainy one along the entire Pacific coast, rain falling almost daily in the districts west of and including the Sierra and Cascade ranges of mountains.

Precipitation was also generally in excess of the normal over the greater part of the Plateau and Rocky Mountain districts, the amounts over portions of the Main Divide from northwestern Colorado to central Idaho exceeding the normal from 2 to 4 inches. There was also a small excess of precipitation over the upper Mississippi Valley, the greater part of the Lake region, the upper Ohio Valley, New York, and New England.

Over the Great Plains from central Nebraska southward to Texas and eastward over the middle and lower Mississippi and lower Ohio valleys and Gulf States to the Atlantic coast there was a general deficiency in precipitation, being most pronounced from central Texas eastward over the Gulf and South Atlantic States, where the monthly amounts were from 2 to 4 inches less than the normal.

At the end of the month the need of rain was being felt over most of Florida, in many portions of Texas, and at other points in the Gulf States.

The excessive amounts of rain, together with the melting snows, on the watersheds of the Sacramento and San Joaquin rivers of California caused phenomenally high waters in these rivers and much damage resulted. Heavy rains and melting snows also caused floods of considerable proportions in the rivers and smaller streams of the western portions of Oregon and Washington.

SNOWFALL.

Snow in measurable quantities occurred in all portions of the United States, except along the immediate south Atlantic and Gulf coasts, and over the lower elevations of Arizona and southern California. Remarkably heavy snows occurred during the early part of the month over the northern portions of the Rocky Mountain, Plateau, and Pacific coast districts, the amounts that fell on the lower levels and in the valleys of western Washington and Oregon were much in excess of the usual fall, and on account of the prevailing cold weather, remained on the ground for an unusual length of time. Snowfall was heavy in nearly all other portions of the mountain districts of the west, and altho much of it melted under the influence of the prevailing warm weather and frequent rainfalls much still remained on the ground in the higher levels at the end of the month. It was generally well packed, hard frozen, and with a large water content, thus indicating a plentiful supply of water for irrigation purposes during the coming season.

A severe snowstorm and blizzard prevailed in the lower Missouri and middle Mississippi valleys during the 28th and 29th. Winds of almost hurricane velocity prevailed, and with the intense cold and drifting snow, much suffering and loss occurred to unprotected live stock, buildings were damaged, electrical communication seriously interfered with, and transportation much delayed, and in some cases completely abandoned.

At the end of the month the ground was generally well covered with snow from the Missouri Valley eastward over the middle and upper Mississippi Valley, Lake region, Ohio Valley, the northern portions of the Middle Atlantic States, and New England, with maximum depths ranging from 10 to 30 inches over northern New York and the interior of New England and at a few points in Michigan and the upper Lake region. In the mountains of the West the greatest amounts were reported from the Sierras of California, where depths from 10 to 15 feet were reported. In the main ranges of the Rocky Mountains the depths were from 10 to 50 inches at moderate elevations, with doubtless much greater depths in the higher mountains.

HUMIDITY AND SUNSHINE.

Relative humidity was above the normal in all portions of the United States, except over the Lake region and at points in the Plateau and southern Rocky Mountain districts. The average for the month was generally high in the upper Mississippi and Missouri valleys and the central and southern Pacific coast districts, the percentages in portions of California averaging from 5 to 15 above the normal. In portions of western Texas and the southern Rocky Mountain district the percentage ranged from 5 to 10 below the normal.

The month was one of general excess of cloudy weather, all portions of the country reporting the amount of sunshine as below the normal, except at a few points in the south Atlantic and Gulf States and generally over the Florida Peninsula, where the sunshine was normal or slightly above. Over large portions of the Ohio and middle Mississippi valleys, Lake region, and New England the amount of sunshine ranged from 30 to less than 20 per cent of the possible, and over the greater portion of the Pacific slope the amount was less than 20 per cent of the possible. At scattered points along the Atlantic and Gulf coasts and over the Florida Peninsula the amount of sunshine was slightly above 50 per cent of the possible, and in western Texas and portions of Arizona it ranged from 70 to 80 per cent.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	12	26.9	+ 2.5		
Middle Atlantic	16	35.8	+ 4.0		
South Atlantic	10	50.2	+ 5.0		
Florida Peninsula*	8	64.3	+ 5.4		
East Gulf	11	52.5	+ 5.1		
West Gulf	10	50.4	+ 4.9		
Ohio Valley and Tennessee	13	33.6	+ 4.5		
Lower Lake	10	28.3	+ 4.2		
Upper Lake	12	21.4	+ 3.3		
North Dakota*	9	3.3	— 1.4		
Upper Mississippi Valley	15	24.9	+ 3.4		
Missouri Valley	12	23.8	+ 2.7		
Northern Slope	9	18.3	— 0.7		
Middle Slope	6	32.5	+ 3.5		
Southern Slope*	7	44.2	+ 4.3		
Southern Plateau*	12	44.2	+ 4.8		
Middle Plateau*	10	31.2	+ 6.4		
Northern Plateau*	12	24.9	— 2.3		
North Pacific	7	35.2	— 4.3		
Middle Pacific	8	50.4	+ 3.3		
South Pacific	4	53.4	+ 2.5		

* Regular Weather Bureau and selected cooperative stations.

In Canada.—Director R. F. Stupart says:

The first part of the month was marked by extremely cold weather in the Western Provinces and British Columbia, and the monthly mean

temperature in that portion of Canada was from 1° to 15° below the average, the difference increasing westward from Manitoba. In Ontario, on the other hand, there was much unseasonably mild weather, as is evidenced by mean temperatures of from 2° to 6° above normal. More seasonable temperature conditions prevailed in Quebec and the Maritime Provinces, and the mean temperature there was in the close neighborhood of the normal value.

The precipitation was less than average over the greater portion of Canada, but in the St. Lawrence Valley and in New Brunswick it was somewhat in excess. The most marked feature, however, was the unusual snowfall in British Columbia, where even near the coast there was sleighing on several days and the higher levels were soon thickly covered. At the close of the month in the Western Provinces the depth varied from a trace in southern Alberta to 8 inches at Edmonton, 14 inches at Prince Albert, and about 6 inches over the most of Manitoba. Ontario was snow covered, the depth ranging from about 2 inches in the south to 27 inches in the Ottawa Valley, and 21 inches in New Ontario. Quebec and northern New Brunswick were buried under a depth of from 20 to 48 inches of snow, while the Maritime Provinces showed a white mantle varying from 5 to 28 inches in depth.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		*Inches.*	*Inches.*
New England	12	3.58	113	+ 0.4	
Middle Atlantic	16	2.57	79	— 0.7	
South Atlantic	10	1.63	44	— 2.1	
Florida Peninsula*	8	2.07	72	— 0.8	
East Gulf	11	1.85	37	— 3.1	
West Gulf	10	0.39	13	— 2.6	
Ohio Valley and Tennessee	13	2.86	74	— 1.0	
Lower Lake	10	2.93	111	+ 0.3	
Upper Lake	12	1.59	80	— 0.4	
North Dakota*	9	0.42	68	— 0.2	
Upper Mississippi Valley	15	1.86	106	+ 0.1	
Missouri Valley	12	0.95	100	0.0	
Northern Slope	9	0.82	100	0.0	
Middle Slope	6	0.22	35	— 0.4	
Southern Slope*	7	0.11	11	— 0.9	
Southern Plateau*	12	0.95	100	0.0	
Middle Plateau*	10	2.10	105	+ 1.0	
Northern Plateau*	12	2.70	169	+ 1.1	
North Pacific	7	8.66	126	+ 1.8	
Middle Pacific	8	11.36	255	+ 6.9	
South Pacific	4	8.07	291	+ 5.3	

*Regular Weather Bureau and selected cooperative stations.

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	77	+ 1	Missouri Valley	80	+ 5
Middle Atlantic	77	+ 1	Northern Slope	75	+ 3
South Atlantic	80	+ 3	Middle Slope	69	+ 2
Florida Peninsula	83	+ 2	Southern Slope	50	—10
East Gulf	78	0	Southern Plateau	59	+ 5
West Gulf	78	+ 2	Middle Plateau	72	— 1
Ohio Valley and Tennessee	80	+ 3	Northern Plateau	76	— 3
Lower Lake	80	— 1	North Pacific	86	+ 1
Upper Lake	81	— 2	Middle Pacific	88	+ 5
North Dakota	88	+ 5	South Pacific	85	+ 13
Upper Mississippi Valley	83	+ 5			

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	7.1	+ 1.3	Missouri Valley	6.5	+ 1.4
Middle Atlantic	6.6	+ 1.0	Northern Slope	5.7	+ 1.1
South Atlantic	5.6	+ 0.3	Middle Slope	5.8	+ 2.0
Florida Peninsula	4.6	— 0.1	Southern Slope	4.8	+ 1.0
East Gulf	5.6	0.0	Southern Plateau	4.4	+ 1.5
West Gulf	6.5	+ 1.1	Middle Plateau	6.4	+ 1.6
Ohio Valley and Tennessee	8.0	+ 1.6	Northern Plateau	7.6	+ 0.3
Lower Lake	7.9	+ 0.4	North Pacific	8.4	+ 1.3
Upper Lake	7.1	+ 0.3	Middle Pacific	8.1	+ 3.0
North Dakota	5.3	+ 0.6	South Pacific	7.6	+ 3.5
Upper Mississippi Valley	7.3	+ 2.0			

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Amarillo, Tex	28	64	w.	North Head, Wash	31	50	se.
Atlanta, Ga	29	60	nw.	North Platte, Nebr	28	58	nw.
Do	30	58	nw.	Oklahoma, Okla	28	64	w.
Bismarck, N. Dak	28	52	nw.	Do	29	66	nw.
Block Island, R. I	7	52	nw.	Omaha, Nebr	28	66	nw.
Do	17	50	e.	Do	29	60	nw.
Do	26	54	nw.	Pierre, S. Dak	28	61	nw.
Do	28	55	nw.	Do	29	51	nw.
Do	29	53	e.	Point Reyes Light, Cal	1	52	s.
Buffalo, N. Y	19	60	sw.	Do	2	54	s.
Do	25	52	sw.	Do	5	53	s.
Do	27	52	sw.	Do	7	60	s.
Burlington, Vt	19	54	s.	Do	8	62	s.
Cairo, Ill	29	56	w.	Do	13	51	sw.
Cape Henry, Va	28	58	nw.	Do	14	60	s.
Columbia, Mo	29	60	nw.	Do	15	54	s.
Detroit, Mich	29	50	e.	Do	20	66	s.
Duluth, Minn	6	54	nw.	Do	21	54	s.
Do	29	71	nw.	Do	22	54	nw.
Do	30	59	nw.	Do	23	51	s.
Eastport, Me	6	60	s.	Do	24	65	s.
Do	30	54	ne.	Do	25	71	s.
Fort Smith, Ark	28	64	w.	Do	29	52	s.
Galveston, Tex	29	50	nw.	Do	30	62	s.
Huron, S. Dak	28	56	n.	Reno, Nev	30	52	sw.
Jacksonville, Fla	29	56	sw.	St. Louis, Mo	30	52	nw.
Kansas City, Mo	28	63	nw.	St. Paul, Minn	29	54	n.
Do	29	74	nw.	Sand Key, Fla	5	55	nw.
Key West, Fla	5	58	w.	Sault Ste. Marie, Mich	25	52	w.
Lincoln, Nebr	28	72	nw.	Sioux City, Iowa	29	72	nw.
Do	29	62	nw.	Southeast Farallon, Cal	20	50	s.
Little Rock, Ark	29	56	nw.	Do	24	51	s.
Memphis, Tenn	28	54	sw.	Do	25	56	sc.
Do	29	64	w.	Springfield, Mo	28	50	sw.
Minneapolis, Minn	29	53	n.	Tatoosh Island, Wash	1	58	e.
Mount Tamalpais, Cal	3	50	sw.	Do	4	57	ne.
Do	8	54	sw.	Do	5	76	e.
Do	9	58	nw.	Do	6	66	e.
Do	12	57	sw.	Do	7	75	e.
Do	13	56	sw.	Do	8	64	e.
Do	14	50	sw.	Do	9	63	e.
Do	20	66	sw.	Do	10	64	e.
Do	21	54	w.	Do	14	60	e.
Mount Weather, Va	12	58	nw.	Do	15	58	s.
Do	28	59	nw.	Do	16	72	s.
Do	30	64	nw.	Do	17	50	s.
Do	31	69	nw.	Do	18	54	sw.
New York, N. Y	27	54	w.	Do	19	62	s.
Do	28	57	nw.	Do	27	56	w.
North Head, Wash	2	62	se.	Do	28	67	e.
Do	14	56	s.	Do	29	58	e.
Do	15	84	se.	Topeka, Kans	28	52	nw.
Do	16	78	se.	Do	29	58	w.
Do	17	72	se.	Valentine, Nebr	28	56	nw.
Do	18	70	se.	Wichita, Kans	28	60	nw.
Do	19	76	se.	Do	29	62	nw.
Do	27	66	nw.	Yankton, S. Dak	28	55	nw.
Do	30	60	se.	Do	29	58	nw.